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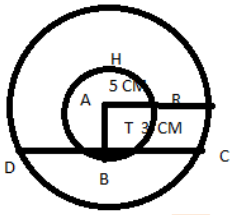
B -147, Sector -6 Noida, UP - 201301,
www.askiitians.com
Email: info@askiitians.com
Tel: 1800-2000-838

Class: X
Subject: Maths
Topic: Circles
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

Question1: Two concentric circles are of radii 13 cm and 5 cm. The length of the chord of larger circle which touches the smaller circle is

(a) 12 cm
(b) 20 cm
(c) 24 cm
(d) 26 cm

Sol: (a)



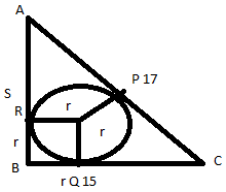
A be Centre
R = 13 cm
r = 5 cm
Ac = R AB = r
Bc = $\sqrt{Ac^2 + AB^2}$
= $\sqrt{13^2 - 5^2}$
= 12
CD is the required chord which is
2Bc = 24 cm (1r from center bisects the chord)

Question2: A circle is inscribed in a triangle with sides 8, 15 and 17 cm. The radius of the circle is

(a) 6 cm
(b) 5 cm
(c) 12 cm
(d) 3 cm

Sol: (d) $8^2\ 15^2 = 17^2$

Hence it is a rt Δ



AB = AR
CP = CQ
BQ = BR

Tangents arawn from external point are equal in length
AP = AR = AB-r = 8-6
Pc = CQ = Bc-r = 15-r
Ac = AP+Pc = 23-2r = 17
R = 3 cm

Question 3: From a point Q, the length of the tangent to a circle is 12 cm and the distance of Q from the centre is 13 cm. The radius of the circle is

(a) 7 cm
(b) 6.5 cm
(c) 5 cm
(d) 9 cm

Sol: (c) Radius $=\sqrt{13^2 + 12^2}$
$= 5$

Question 4: If a line touches the circle at only one point, then it is known as

(a) Chord
(b) Secant
(c) Tangent
(d) Segment

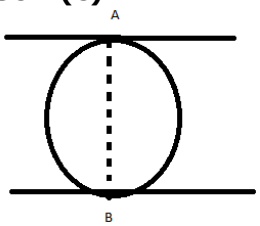
Sol: (c) Fact

Question 5: Two parallel lines touch the circle at points A and B respectively. The area of the circle is 25 π cm^2, then AB is equal to

(a) 5 cm
(b) 8 cm
(c) 10cm

(d) 25 m

Sol: (c)



Clearly AB will be diameter
Area = $\Lambda r^2 = 2^5\Lambda$
r = 5
Diameter = 10 cm

Question 6: A line is tangent to a circle with radius 5 cm. Distance between the centre of circle and the line m is

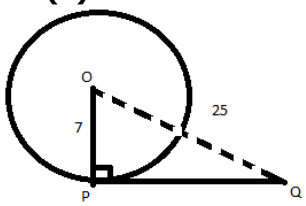
(a) 3 cm
(b) 4 cm
(c) 5 cm
(d) 6 cm

Sol: (c) Radius its distance

Question 7: A tangent PQ at a point P of a circle of radius 7 cm meets a line through centre O at a point Q so that OQ = 25 cm length PQ is

(a) 20 cm
(b) 14 cm
(c) 24 cm
(d) 26 cm

Sol: (c)



PQ = $\sqrt{OQ^2 + PO^2}$
= 24

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Question 8: The common point of the tangent and the circle is called

(a) Golden pint
(b) Point of contact
(c) Point of intersection
(d) Degenerate point

Sol: (b) fact

Question 9: A line touches a circle of radius 4 cm. Another line is drawn which is tangent to the circle. If the two lines are parallel, then distance between them is

(a) 4 cm
(b) 6 cm
(c) 7 cm
(d) 8 cm

Sol: (d) distance between them is equal to its diameter

Question10: If a line intersects a circle in two distinct points, then it is known as a

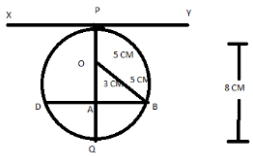
(a) Chord
(b) Secant
(c) Tangent
(d) Segment

Sol: (b) fact

Question11: At one end P of a diameter PQ of a circle of radius 5 cm, tangent XPY is drawn. The length of the chord RS parallel to XY and at a distance of 8 cm from P is :

(a) 7 cm
(b) 5 cm
(c) 8 cm
(d) 6 cm

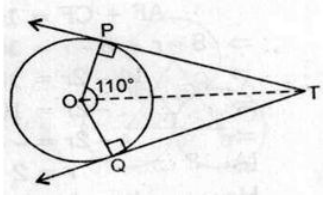
Sol: (c)



AB = $\sqrt{5^2 + 3^2}$ = 4

B Δ (required chord) = 2x4 = 8 cm

Question12: In the given figure, If TP and TQ are two tangents to a circle with centre O, so that $\angle POQ=110°$, then $\angle PTQ$ is equal to :



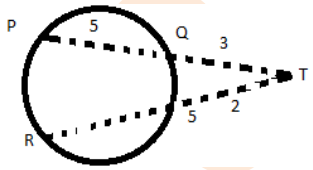
(a) 60°
(b) 90°
(c) 70°
(d) 80°

Sol: (c) ∠ PTQ = 360 – 110 – 90 – 90 = 70

Question13: Two chords PQ and RS intersect at T outside the circle. If PQ = 5 cm, QT = 3 cm, TS = 2 cm. length of RS is :

(a) 15 cm
(b) 8 cm
(c) 10 cm
(d) 12 cm

Sol: (c)



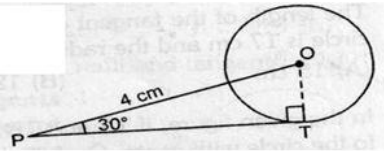
PT X QT = RT X ST

8X3 = RT X 2

: 12 = RT

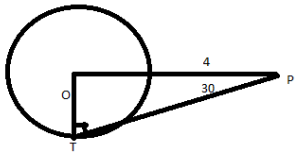
: RS = 12-2 = 10cm

Question14: In figure, PT is tangent to the circle with centre O such that OP is 4 cm and $\angle OPT=30°$ length of tangent is given by :



(a) 2√3cm
(b) 5 cm
(c) 7 cm
(d) 4 √3 cm

Sol: (a)



Cos 30 = $\frac{PT}{OP}$

PT = OP COS 30 = 4 X $\sqrt{\frac{3}{2}} = 2\sqrt{3}$ CM

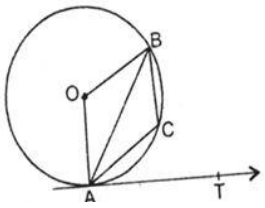
Question15: From a point Q, the length of tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm, radius of circle is :

(a) 8 cm
(b) 7 cm
(c) 6 cm
(d) 10 cm

Sol: (b) Radius = $\sqrt{25^2 + 24^2}$

= 7 cm

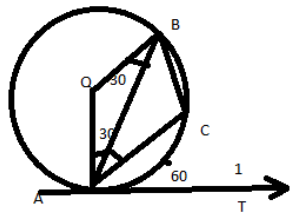
Question16: In figure, AB is a chord of a circle and AT is a tangent at A such that $\angle BAT=60°$, measure of $\angle ACB$ is :



(a) 120°
(b) 90°

(c) 150^o
(d) 110^o

Sol: (a)



OAT = 90

(Radius and tangent are perpendicular)

$\angle OAB + \angle BAT = 90$

$\angle OAB = \angle OBA = 30^o$

$\angle OAB = \angle OBA = 30$ (Isosceles)

$\angle AOB = 120^0$ ($\angle$ sum Property)

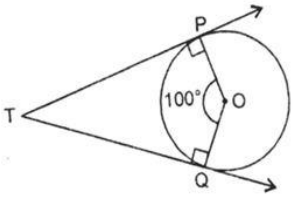
Reflex $\angle AOB = 240^0$

$\angle BCA = \frac{1}{2}$ Reflex x $\angle AOB$

$\angle BCA$ or $\angle ACB = 120^0$

($\angle$Subtend by re at center is thrice the $\angle$ subtended by it on the some segment)

Question17: In the adjacent figure, if TP and TQ are two tangents to a circle with centre O, so that $\angle PQO=100^\circ$, then $\angle PTQ$ is equal to



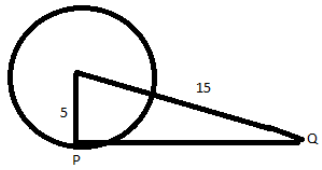
(a) 80^o
(b) 60^o
(c) 40^o
(d) 90^o

Sol: (a) L PT Q = 360 – 100 – 90 – 90 = 80

Question18: A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q, such that OQ = 15 cm. Length of PQ is

(a) 10 √2 cm
(b) 12 cm
(c) 11√9 cm
(d) 13 cm

Sol: (a)

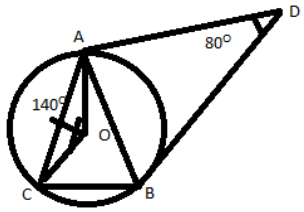


PQ = $\sqrt{15^2 + 5^2}$

= $\sqrt{200}$

= $10\sqrt{2}$

Question19: In given figure, O is centre of the circumcircle of Δ ABC. Tangents at A and B intersect at D Given ∠ADB = 80^0 and ∠ AOC = 140^0, calculate the ∠ ACB.



(a) 20^0
(b) 40^0
(c) 60^0
(d) 80^0

Sol: (c) AD and BD are tangents from an external point D to a circle with centre O.

∠ **AD** = BD

In ΔADB, we have AD = BD

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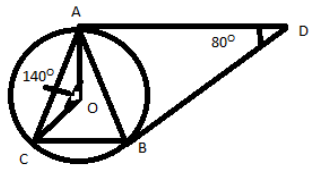

∠DAB = ∠DBC

[Since these are angles opposite to equal sides of a triangle]

180^0 = ∠ADB + ∠DAB + ∠DBA

⇒ 80^0 + ∠DAB + ∠DBA = 180^0

So, ∠DAB + ∠ DBA = 100^0

⇒ ∠DAB = ∠ DBA = 50^0

OA ⊥ AD [∵ The radius of a circle is perpendicular to the tangent through the point of contact]

⇒ ∠OAD = 90^0

∠OAB = ∠OAD - ∠DAB = 90^0 – 50^0 = 40^0

In ΔOAC, we have

OA = OC [Radii of the same circle]

∴ ∠OAC = ∠OCA [∠s opp. To equal sides]

But ∠AOC = 140^0

⇒ ∠OAC + ∠OCA = 180^0 - ∠AOC = 180^0 – 140^0 = 40^0

⇒ ∠OAC + ∠OCA = 20^0

Now, ∠CAB = ∠OAC + ∠OAB = 20^0 + 40^0 = 60^0.

Question20: In the diagram, O is the centre of the circle ABCD. The straight lines AC and BD intersect at O. The tangent at A meets CD Produced at E and ∠ AED = 32^0. Calculate ∠ABD and ∠AOB

(a) 58^0,116^0
(b) 62^0,124^0
(c) 44^0,88^0
(d) 58^0,124^0

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Sol: (a) Since A, B, C, D are four points on circle having centre O and AC and BD intersect at O.

So, OA = OB = OC = OD . Since EA is tangent at A, OA $\perp$ EA.

In Δ AOB, OA = OB ⇒ ∠BAO = ∠ABO. So, it is isosceles.

Similarly, ΔDOC is also isosceles

∠ABD = ∠CAB = ∠BDC = ∠ACD.

From right angle ΔEAC

$\angle ACE = 90^0 - 32 = 58^0$

∠ACE is ∠ACD = ∠ABD.

So, $\angle ABD = 58^0$

(B) $\angle AOB = \angle DOC$ and $\angle AOB + \angle OAB + \angle OBA = 180^0$

$\Rightarrow \angle AOB + 2 \times 58 = 180 \Rightarrow \angle AOB = 180 - 116$

$\Rightarrow \angle AOB = 64^0 = \angle DOC$

$\angle AOD = 180 - \angle DOC = 180 - 64$

So, $\angle AOD = 116^0$